

Name: \_\_\_\_\_

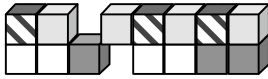
# Grade 5

## PATTERNING & ALGEBRA: INVESTIGATING PATTERNS 1

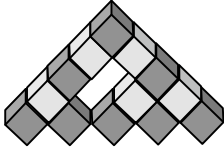
Don't forget to play Pattern Mania game first! Go to [mathfrog.ca](http://mathfrog.ca) for the link.

1. Circle the shape at the right which fits into the open space at the left.

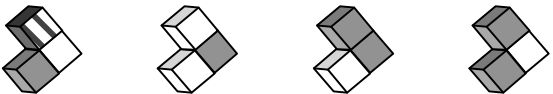
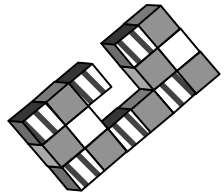
a)



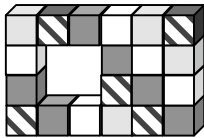
b)



c)

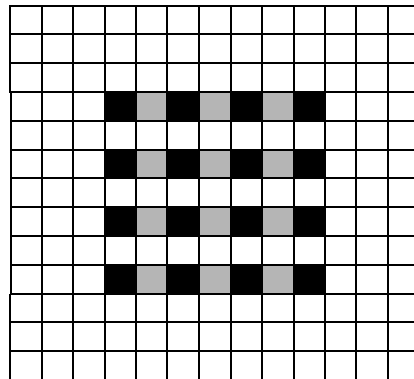


d)

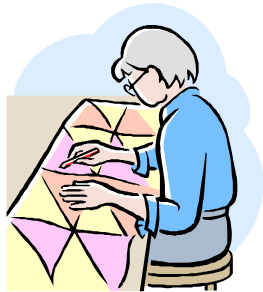
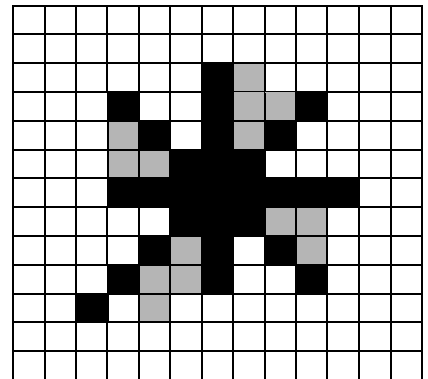


2. Below, grandma has started two quilt patterns. Please complete each quilt.

a)



b)



3. Without using your calculator, complete the following pattern.

$$1 \times 1 = 1$$

$$11 \times 11 = 121$$

$$111 \times 111 = 12321$$

$$1111 \times 1111 = \underline{\hspace{2cm}}$$

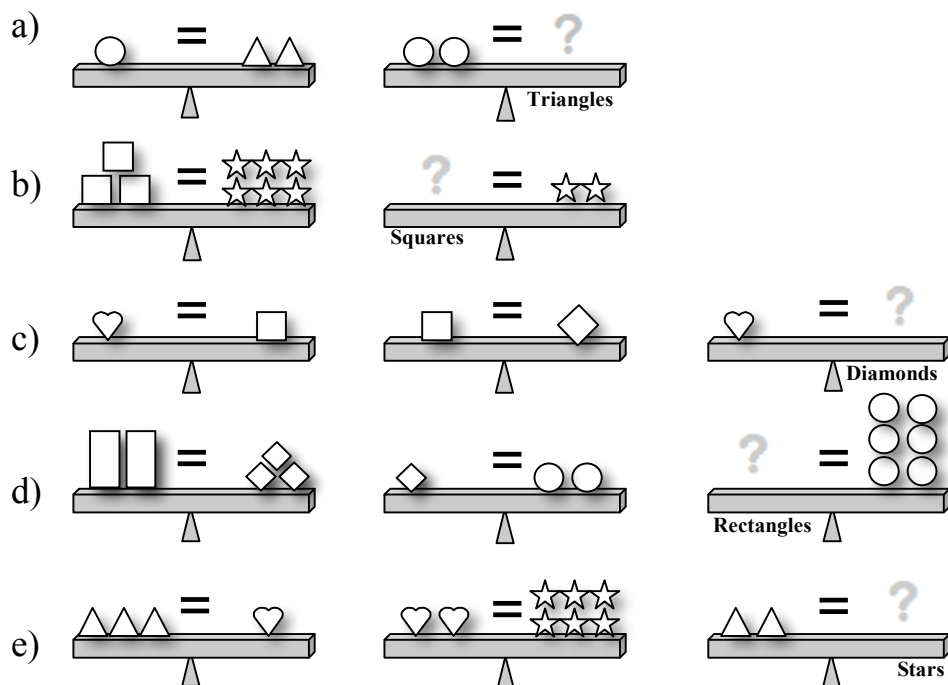
$$11111 \times 11111 = \underline{\hspace{2cm}}$$

$$111111 \times 111111 = \underline{\hspace{2cm}}$$




When finished,  
you may use a  
calculator to check  
your answers!

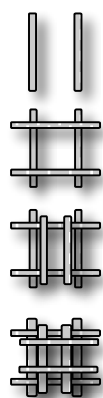
4. Replace each “?” with the requested shape(s) to balance each scale.



### DID YOU KNOW?

 One in four snowflakes has a perfect hexagonal (six-sided) pattern.

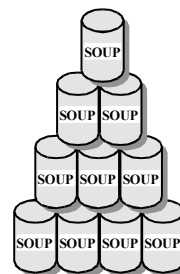
5. At their campsite, a troop of Girl Scouts gather logs to build a fire. They plan to build a pile 10 levels high. Complete the chart to determine how many logs they will need.



Level	Total Number of Logs
1	2
2	4
3	
4	
5	
6	
7	
8	
9	
10	

6. In a grocery store, cans of soup are stacked as shown in the diagram. Complete the chart to determine the number of cans in a pyramid with 10 rows.

Row Number	Number of Cans in Row	Total Number of Cans
1	1	1
2	2	3
3	3	6
4	4	
5		
6		
7		
8		
9		
10		



## TRY THIS!

a) Evaluate each of the following. b) Describe the pattern in a).

$$(1 \times 1) - (0 \times 0) = \underline{\hspace{2cm}}$$

$$(2 \times 2) - (1 \times 1) = \underline{\hspace{2cm}}$$

$$(3 \times 3) - (2 \times 2) = \underline{\hspace{2cm}}$$

$$(4 \times 4) - (3 \times 3) = \underline{\hspace{2cm}}$$

$$(5 \times 5) - (4 \times 4) = \underline{\hspace{2cm}}$$

c) Use this pattern to determine the value of:

i)  $(100 \times 100) - (99 \times 99) =$  \_\_\_\_\_

ii)  $(1234567 \times 1234567) - (1234566 \times 1234566) =$  \_\_\_\_\_